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(54) Hydrogel wound dressing product.

(57) A flexible wound dressing product (10) includes a thin-film layer (14), an adhesive layer (24), a backing layer (26) which may be porous, an optional support layer (34), an optional release liner (46), and a hydrogel material (42). Where the backing layer is porous, the backing layer can be secured to the hydrogel material without the use of an adhesive. In another embodiment, the backing layer may be transparent to permit viewing of the healing process without removal of the wound dressing. The wound dressing may also include a removable tab (48) interposed between the thin film layer (14) and release liner (46), providing a grippable surface for the removal of the release liner (46) from the transparent thin film layer (14) and to facilitate the handling of said wound dressing during application of the dressing to the wound.

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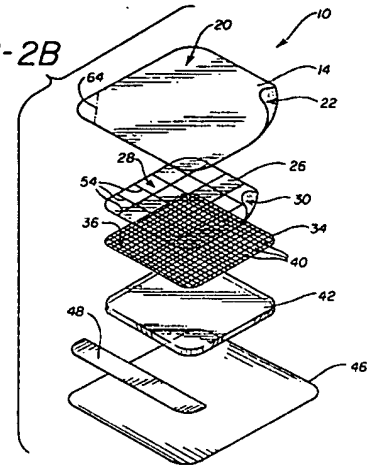
FIG-2B



The present invention relates to wound dressings and, more particularly, to a flexible wound dressing product containing a hydrogel substance and preferably a porous layer.

Secreting skin wounds, such as decubitus ulcers and open surgical wounds, have long presented a medical challenge in keeping such wounds sterile and relatively dry. The accumulation in wound crevices of wound exudate, such as blood, pustulation and other wound fluids, promotes growth of bacteria and crusted organisms which cause infection and delay the healing process. However, since it is often desirable to allow a wound to heal in a slightly moist or occlusive state, as it is believed that this may accelerate healing, excess wound exudate must be removed. If excess wound exudate remains on a wound, a "blister" of exudate can form under the wound dressing which is not only unsightly, but also may cause the dressing to leak, thereby defeating the aim of sterility. Existing methods of aspiration, however, can lead to wound infection or can destroy sterility. Additionally, it is not desirable to remove all exudate, as that would result in a dry wound and, hence, a slower healing process.

Known aqueous moisture-absorbing wound dressing systems have additional problems in that the aqueous material is generally contained in the center portion of a wound dressing, with a bulky adhesive border, such as a foam border. Problems with such borders include decreased comfort, conformity and adhesion, as well as the existence of a "lifting edge" that can catch on clothes or bed sheets, thereby exposing the wound to bacteria and infection. In addition, observation of the wound by medical personnel may require lifting the wound dressing, thereby exposing the wound, again creating a situation where bacteria and infection can be introduced to the wound site.

Adhesive wound dressings, similar to that disclosed by Ward, U.S. Pat. No. 4,753,232, issued June 28, 1988, are frequently constructed of a Polymer film having one adhesive surface. The polymer film is extremely thin and, therefore, difficult to handle during application to the wound. Further, it is desirable to apply the wound dressing to the patient's skin without touching the surface of the dressing that is to come into contact with the skin. The prior art discloses several methods for facilitating handling of the wound dressing. Ward, for instance, discloses a "handle" portion along one edge of the dressing. After the dressing is applied, the handle may be removed by tearing, or it may carry an adhesive coating so that it may be adhered to the skin of the patient.

An existing method of avoiding contact with the edges of a bandage by fingers or forceps is disclosed in Brower, U.S. Pat. No. 4,646,731, issued Mar. 3, 1987. Brower discloses an adhesive-coated bandage whose edges are protected by a pair of folded V-shaped tabs. After the backing sheet is removed from the bandage, one tab is removed and the corresponding end of the bandage is applied to the skin. The second tab is grasped and removed as the entire length of the bandage is then applied.

Faasse, Jr., U.S. Pat. No. 4,744,355, issued May 17, 1988, solves a problem associated with excessive peeling force during removal of backings from wound dressings. The Faasse patent teaches a release liner adhesively attached to each end of a wound dressing strip (covering layer). A hinge arrangement is provided between each release liner and the dressing. As the release liners are Pulled away from the wound dressing strip, the hinge means are employed, thus reducing the peeling force on the covering layer and preventing the liners from pulling away from the covering layer prematurely.

United Kingdom Patent Application No. 2,128,479 describes a surgical dressing with two release sheets, each covering half of the dressing and having a free edge curved at the center of the dressing. As the curved edges of the release sheets are peeled back, the center of the dressing is applied to the wound, followed by the ends, thereby preserving sterility by eliminating the need to touch the adhesive surface of the dressing.

European Patent Application Pub. No. 0 168 174 discloses a relatively rigid carrier section with bent handles over the outer surface of a thin-film dressing. The carrier section aids in keeping the dressing extended during application and prevents the ends from curling. The reference further discloses a tab portion along one edge of the dressing. This tab portion is not coated with adhesive. It may be grasped during application of the dressing to the patient's skin and is removable afterward by tearing.

Our own commonly-assigned U.S. Patent No. 5,106,629, issued Apr. 21, 1992, to Cartmell et al., discloses a hydrogel wound dressing with a thin-film transparent layer, a dimensionally stable backing layer over the outer surface of the transparent layer, and a release liner. The backing layer and the release liner each have a corner tab to facilitate the peeling of each from the transparent layer. The hydrogel material is positioned in a center portion of the transparent layer, and the adhesive perimeter portion of the transparent layer adheres to the skin of the patient. The dimensionally stable backing member prevents the transparent layer from curling and facilitates handling of the dressing during its application.

Only the Cartmell et al. reference discloses a wound dressing containing a hydrogel material for

the absorption of wound exudate. Further, the means taught by the aforementioned references for facilitating the handling of a thin-film wound dressing layer are fairly complicated and may involve substantial expense in manufacture and materials, particularly when viewed in relation to the overall cost of the wound dressing.

It is seen, therefore, that there is a need for a hydrogel wound dressing product that may be easily handled during application to the wound without touching the adhesive side of the dressing. Further, there is a need for a hydrogel wound dressing product that is inexpensive and simple to manufacture, and easily removed from a release liner and applied to a wound.

Many prior art wound dressings contain layers constructed of polyurethane or other polymeric material. Such materials, however, have limited moisture/vapor permeability characteristics. The wound is often not able to breathe adequately. Thus, there is also a need for a hydrogel wound dressing product that contains a porous, moisture- and vapor-permeable layer.

The present invention meets these needs by providing a thin-film wound dressing containing a hydrogel material. The wound dressing product herein can be manufactured to any desirable size to provide a thin-film, fluid-absorbing dressing for a wound of any size. The wound dressing herein is conformable, adhesive around its perimeter portion, and nonadhesive over the wound site. In some embodiments of the invention, the wound dressing may also be transparent to permit inspection of the wound as it heals. The present invention may also comprise a porous layer that is moisture- and vapor-permeable and which permits the transpiration of moisture through the wound dressing.

The wound dressing product of the present invention comprises an optional release liner, an optional removable tab, and wound dressing. The wound dressing comprises a thin-film layer, preferably composed of polyurethane, an adhesive layer, an optional porous backing layer, an optional support layer and a hydrogel material. The thin-film layer, which may be of any suitable shape, but which typically is generally rectangular in shape, may have a center portion and a perimeter portion surrounding the center portion, in addition to a first side and an opposing second side. The thin film layer may also be transparent. When the dressing is applied to the wound, the first side of the thin-film layer forms the outer surface of the dressing product. The thin-film layer may, alternatively, be constructed of materials other than polyurethane, such as polyethylene, vinyl, or other suitable materials, and may also be perforated throughout in order to improve the moisture- and vapor-permeability of the wound dressing.

The adhesive layer is positioned on the second side of the thin-film layer. In one embodiment of the invention, the backing layer is constructed of a porous material comprising a foam material including silica and a polyolefin, wherein the porous material has a porosity ranging from about 30% to about 80%. The porous backing layer has a first side and an opposing second side, and is adhered to the second side of the thin-film layer by means of the adhesive layer. Alternatively, the backing layer may be composed of a nonporous, transparent polyurethane.

The support layer, which is optional when the backing layer is of a porous material, is made from a material such as woven and nonwoven fabrics, gauze, scrim or other similar materials. The hydrogel material may be secured to the second side of the support layer. The permeable fabric of the support layer allows the hydrogel material to pass through to the first side of the support layer, resulting in the presence of the hydrogel layer on the first, as well as the second, side of the support layer. As such, the first side of the support layer, along with the hydrogel layer, is secured to the second side of the porous backing layer by an adhesive-like bond between the hydrogel layer and porous backing layer. The backing layer possesses sufficient porosity to allow an adhesive contact to be made between the backing layer and the hydrogel material present on the first side of the support layer. The porous backing layer obviates the need for a second adhesive layer, and is moisture- and vapor-permeable. In an alternative embodiment, where the backing layer is of a transparent, but nonporous, material, a second adhesive is needed to secure the support layer to it.

The optional support layer adds increased stability and support to the hydrogel material. In embodiments in which the support layer is not used, the hydrogel material is secured directly to the second side of the porous backing layer.

The hydrogel material is preferably a saline solution in an aqueous gel-like phase, and is contained within the center portion of the thin-film layer. The gel-like consistency of the hydrogel material creates a bond between the wound dressing and the wound site without creating an actual adhesive attachment that would damage new cell tissue upon removal. An advantage of the gel-like hydrogel is that it will not deteriorate as the wound fluids are absorbed. Additionally, it permits clean and neat removal of the wound dressing when the wound heals or the dressing is changed.

The optional release liner, which is preferably silicone-coated, overlies the hydrogel material and is secured to the perimeter portion of the second side of the thin-film layer by means of the adhesive layer. The optional removable tab is interposed

between the thin-film layer and the release liner. The tab is adhered to one edge of the perimeter portion of the second side of the thin-film layer by means of the adhesive layer so as to provide a free grippable surface to allow for the removal of the release liner from the thin-film layer and to facilitate the handling of the wound dressing during application of the dressing to the wound. In one embodiment, the porous backing layer and/or the thin-film layer may be flesh-colored, in order to make the wound dressing product less conspicuous on the patient's skin.

Where a transparent backing layer is used, it may be printed with a grid-like pattern to allow medical personnel to monitor the healing of the wound, without removing the wound dressing, by measuring its size. A clear view of the wound is provided through the wound dressing, each layer of which is transparent in this embodiment of the invention.

In accordance with one aspect of the present invention, the optional removable tab is flat and is constructed of double-coated paper, polystyrene, polyester, or other suitable material. Alternatively, the tab may comprise a V-shaped member that is preferably silicone-coated. This V-shaped member has a first flap and a second flap, with the first flap being secured to the second side of the thin-film layer by means of the adhesive layer, and the second flap being positioned between the first flap and the release liner. The open end of the V-shaped member is positioned along one edge of the thin-film layer and the opposing edge of the release liner. In both embodiments, the tab is removable by peeling after the wound dressing is applied to the patient's skin. The tab also aids in adding stability to the thin-film layer as the release liner is removed from the thin-film layer.

The release tab may also be eliminated altogether. In its place, the adhesive layer is applied to the second side of the thin-film layer so as to leave an edge or corner of the thin-film layer uncoated with adhesive. The wound dressing may then be removed from the release liner, without the use of a separate removable tab, by grasping the uncoated edge or corner of the thin-film layer. The uncoated portion of the thin-film layer may also be perforated or otherwise detachable by tearing.

Accordingly, it is a feature of the present invention to provide a wound dressing product containing a hydrogel substance which is particularly advantageous when used to dress exuding wounds, such as decubitus ulcers, by providing a skin-like media which is biocompatible, nonirritating, fluid-absorbing, and bacterial-protective; to provide a wound dressing that is easily handled and applied to a wound without touching the adhesive portion of the dressing; to provide a wound dressing that is transparent, thereby allowing medical personnel to observe the healing progression of a wound without removing the wound dressing; to provide a wound dressing that is easily handled and applied to a wound without touching the adhesive portion of the dressing; and to provide a wound dressing containing a highly porous backing layer which adheres to the hydrogel material without the use of an adhesive layer, thus providing a wound dressing that is less expensive to manufacture and has fewer materials than existing wound dressings.

Other features and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims. In order that the invention may be more readily understood, reference will now be made by example to the accompanying drawings, in which:

Fig. 1 is a perspective view of one embodiment of the wound dressing product.

Figs. 2A and 2B are exploded perspective views, illustrating the layers which form alternative embodiments of the wound dressing product.

Fig. 3 is an exploded side view of the wound dressing product of Fig. 2B, showing the optional removable tab.

Fig. 4 is a cross-sectional view of the wound dressing product of Fig. 1 taken along line 4--4.

Fig. 5 is a side view of the wound dressing product which illustrates the peeling of the release liner from the wound dressing.

Fig. 6 is a perspective view showing the wound dressing in place on the patient's skin.

Figs. 7 and 8 illustrate another embodiment in which the flat, polystyrene tab of Figs. 1-6 is replaced with a V-shaped tab.

Figs. 9A through 9D illustrate the preferred method of application of the wound dressing product of the present invention.

Referring now to Fig. 1, the wound dressing product 10 of the present invention is shown. Although the wound dressing product 10 illustrated in Fig. 1 has a rectangular shape, it may be any of a variety of desired shapes, including a more elongated rectangular shape. The wound dressing product 10 is composed of several layers, as illustrated by exploded views of Figs. 2A and 2B as well as the exploded side view of Fig. 3.

Referring, collectively, to Figs. 1, 2A and 3, the wound dressing product 10 includes a thin-film layer 14, preferably of polyurethane, which may have a center portion 16 and a perimeter portion 18. The perimeter portion 18 may completely surround the center portion 16 of thin-film layer 14 or, alternatively, the center portion 16 may extend to the edges of two opposing sides of said thin-film layer 14. The thin-film layer 14 has a first side 20 and a second side 22, the second side 22 being

coated with an adhesive layer 24. Backing layer 26, preferably constructed of a porous material comprising a foam material including silica and a polyolefin, and having a first side 28 and a second side 30, is adhered to the second side 22 of thin-film layer 14 by means of adhesive layer 24. The wound dressing further comprises an optional support layer 34 having a first side 36 and a second side 38, which is made from a material such as woven and nonwoven fabrics, gauze, scrim or other similar materials.

Hydrogel material 42, having a first side 43 and second side 45, is adhered to the second side 38 of support layer 34. The permeable fabric of the support layer 34 contains interstices 40 which allow the hydrogel layer 42 to pass through to the first side 36 of support layer 34, resulting in the presence of hydrogel layer 42 on both the second side 38 and the first side 36 of support layer 34. The hydrogel material 42 is preferably a saline solution in an aqueous gel-like phase. The first side 36 of support layer 34 is attached to the second side 30 of porous backing layer 26. The hydrogel material 42 residing on first side 36 of support layer 34 forms an adhesive-like bond to the second side 30 of backing layer 26, also securing support layer 34 thereto.

Backing layer 26 is sufficiently porous to adhere to hydrogel material 42 without the use of a separate adhesive layer and, preferably, has a porosity ranging from about 30% to about 80%. The preferred porous material is a microporous synthetic sheet commercially available from PPG Industries, Inc., under the trademark Teslin®. The use of a porous layer such as the above-described backing layer 26 obviates the need for a separate adhesive layer between hydrogel layer 42 and backing layer 26. Those skilled in the art will understand that the extent to which the porous material must be porous will depend upon the particular gel material chosen to form the hydrogel material 42. Further, those skilled in the art will appreciate that sufficiently porous materials other than those described herein may be used without departing from the scope of the invention.

The hydrogel material 42, optional support layer 34 and backing layer 26 together form a hydrogel patch 44, which is contained within the center portion 16 of thin-film layer 14. In one embodiment of the present invention, the center portion 16 extends to the edges of two opposing sides of thin-film layer 14, and the hydrogel patch 44 is substantially aligned along two opposing sides with said thin-film layer 14. An optional release liner 46, preferably of a silicone-coated sheet material, may overlay the hydrogel material 42 and may be secured to the perimeter portion 18 of the second side 22 of thin-film layer 14 by means of adhesive layer 24. One skilled in the art will recognize that the release liner 46 may be eliminated and that the wound dressing may, instead, be stored in an airtight package in order to preserve the sterility of the wound dressing 12 and the gel-like consistency of the hydrogel material 42.

Referring, now to an alternative embodiment of the invention illustrated in Fig. 2B, and where like reference numerals represent like elements, the wound dressing product 10 includes a thin-film transparent layer 14, preferably of polyurethane, which has a center portion 16 and a perimeter portion 18. The transparent layer 14 has a first side 20 and a second side 22, the second side 22 being coated with an adhesive. Backing layer 26, preferably constructed of a nonporous, transparent polyurethane and having a first side 28 and a second side 30, is adhered to the second side 22 of transparent layer 14 by means of an adhesive. A second adhesive is positioned on the second side 30 of backing layer 26 in order to accommodate first side 36 of a support layer 34. The support layer 34 is made from a material such as woven and nonwoven fabrics, gauze, scrim or other similar materials.

A hydrogel material 42 is adhered to the second side of support layer 34. The permeable fabric of the support layer 34 contains interstices 40 which allow the hydrogel layer 42 to pass through to the first side 36 of support layer 34, resulting in the presence of hydrogel layer 42 on both the second side and the first side 36 of support layer 34. The hydrogel material 42 is preferably a saline solution in an aqueous gel-like phase. The hydrogel material 42, support layer 34 and backing layer 26 together form a reinforced hydrogel patch, which is contained within the center portion 16 (see Fig. 1) of transparent layer 14. A release liner 46, preferably of a silicone-coated sheet material, overlies the hydrogel material 42 and is secured to the perimeter portion 18 of the second side 22 of transparent layer 14 by means of an adhesive layer. The backing layer 26 is printed with a grid pattern 54 to allow medical personnel to monitor the healing of the wound, without removing the wound dressing 12, by measuring its size. A clear view of the wound is provided through the dressing 12, each layer of which is preferably transparent. Although Fig. 2B illustrates a rectangular grid pattern 54, any suitable grid pattern may be incorporated.

Referring now additionally to Figs. 4-6, an optional removable tab 48 may be interposed between the thin-film layer 14 and the release liner 46. The tab 48 is adhered to one edge 50 of the perimeter portion 18 of thin-film layer 14 by means of the adhesive layer 24, so as to provide a grippable surface to allow for the removal of the re-

lease liner 46 from thin-film layer 14 and to facilitate the handling of the wound dressing 12 during application of the wound dressing 12 to the wound.

The gel-like consistency of the hydrogel material 42 creates a bond between the wound dressing 12 and the wound site without creating an actual adhesive attachment that would damage new cell tissue upon removal. An advantage of the gel-like hydrogel material 42 is that it will not deteriorate as the wound fluids are absorbed. Additionally, it permits clean and neat removal of the wound dressing 12 when the wound heals or the dressing 12 is changed.

In one embodiment of the present invention, the optional removable tab 48 is constructed of a double-coated paper, polystyrene, polyester, or other suitable material, and is preferably flat, as shown in Figs. 1 and 3-6. Figs. 7 and 8 illustrate a second embodiment, wherein the flat tab 48 is replaced with a V-shaped member 56. The V-shaped member 56 has a first flap 58 and a second flap 60, with the first flap 58 being secured to one edge 50 of the second side 22 of thin-film layer 14 by means of adhesive layer 24, and the second flap 60 being positioned between first flap 58 and one edge 52 of release liner 46. The V-shaped member 56 and the release liner 46 are preferably coated with silicone. This enables the V-shaped member 56 to be more easily removed from the thin-film layer 14, and enables the release liner 46 to be more easily removed from the thin-film layer 14 and hydrogel material 42. Both the tab 48 and the V-shaped member 56 are removable by peeling after the wound dressing 12 is applied to the wound site. The tab 48 and V-shaped member 56 also aid in adding stability to the thin-film layer 14 as release liner 46 is removed from the wound dressing product 10.

Alternatively, tab 48 and V-shaped member 56 may be eliminated altogether. Adhesive layer 24 may be applied to thin-film layer 14 in such a manner as to leave a portion of thin-film layer 14 uncoated. As illustrated in Fig. 2A, nonadhesive portion 64 provides a grippable surface to facilitate removal of thin-film layer 14 from release liner 46. One skilled in the art will appreciate that a number of possible locations exist on thin-film layer 14 for placement of nonadhesive portion 64; nonadhesive portion 64 need not be located on a corner of thin-film layer 14.

Figs. 9A through 9D illustrate the preferred method of application of the wound dressing product 10 to a wound. Although these figures illustrate the application of a wound dressing 12 having a V-shaped member 56, a similar procedure may be used to apply the wound dressing 12 of Figs. 2-5 wherein a flat tab 48 or nonadhesive portion 64 is utilized. As shown in Fig. 9A, the release liner 46 is first removed from the wound dressing 12 by grasping V-shaped member 56 and one edge 50 of thin-film layer 14 with one hand, while grasping release liner 46 with the other hand. After the edge 50 of thin-film layer 14 is removed from release liner 46, edge 50 is applied to the skin surrounding the wound of the patient. Edge 50 is then held in place while the release liner 46 is fully removed from wound dressing 12, as shown in Fig. 9B. After release liner 46 is removed, the wound dressing 12 is secured to the wound, as illustrated in Fig. 9C. As shown in Fig. 9D, V-shaped member 56 is then removed by pulling flap 60 with one hand while the opposite end of thin-film layer 14 of wound dressing 12 is held against the skin by the other hand.

The preferred hydrogel material 42 is a polyurethane formed from an aqueous mixture including from about 0% to about 90% by weight polyhydric alcohol; from about 6% to about 60% by weight aliphatic diisocyanate-terminated prepolymer; from about 4% to about 40% by weight polyethylene oxide-based polyamine; up to about 2% by weight sodium chloride; and the balance water. A more preferred hydrogel composition for forming hydrogel layer 42 comprises from about 15% to about 30% by weight of a polyhydric alcohol selected from a group consisting of polypropylene glycol, polyethylene glycol and glycerine, from about 8% to about 14% by weight isophoronediisocyanate-terminated prepolymer, from about 5% to about 10% by weight polyethylene oxide-based diamine, up to about 1% by weight of a salt, and the remaining percentage water. Most preferably, the hydrogel material 42 includes 17% polypropylene glycol, 12% isophoronediisocyanate-terminated prepolymer, 9% polyethylene oxide-based diamine, 1% salt, and 61% water. The hydrogel material 42 provides a biocompatible, nonirritating, fluid-absorbing, bacterial-protective, cushioning, skin-like media over the wound site.

The wound dressing product 10 of the present invention is particularly advantageous for use on exuding wounds. In particular, a special feature of the hydrogel material 42 is that it retains its gel-like integrity even upon removal of the wound dressing 12 from a wound site. The hydrogel material 42 does not leave debris in the wound when the wound dressing 12 is removed, nor does it adhere to the wound site. The benefit of this feature is that the preferred hydrogel material 42 exhibits a capability of nontraumatically releasing from the wound when the wound dressing 12 is removed, so as to not destroy new cell tissue forming at the wound site. Thus, healing is not inhibited by removal of the dressing 12. A further benefit of the present invention is that the porous backing layer 26 allows for attachment of the hydrogel material 42 directly

to the backing layer 26 without the use of a separate adhesive layer. The use of the porous material, therefore, results in a wound dressing product that is simpler and less expensive to manufacture.

Having described the invention in detail and by reference to preferred embodiments thereof, it will be apparent that modifications and variations are possible without departing from the scope of the invention which is defined in the appended claims.

Claims

1. A wound dressing product (10), comprising:
   a thin-film layer (14) having a center portion (16) and a perimeter portion (18) around said center portion and further having first side (20) and a second side (22);
   an adhesive layer (24) positioned on said second side (22) of said thin-film layer (14);
   a porous backing layer (26) having a first side (28) and a second side (30), said first side (28) adhered to said second side (22) of said thin-film layer (14) by said adhesive layer (24); and
   a hydrogel material (42) having a first side (43) and a second side (45), said first side (43) of said hydrogel material (42) forming an adhesive-like bond to said second side (30) of said porous backing layer (26).

2. A wound dressing product as claimed in claim 1, in which said porous backing layer (26) comprises a filled polyolefin foam.

3. A wound dressing product as claimed in claim 1, further comprising a release liner (46) secured to said second side (45) of said hydrogel material.

4. A wound dressing product as claimed in claim 1, wherein said hydrogel material (42) comprises:
   (a) from about 0% to about 90% by weight polyhydric alcohol;
   (b) from about 6% to about 60% by weight aliphatic diisocyanate-terminated prepolymer;
   (c) from about 4% to about 40% by weight polyethylene oxide-based polyamine;
   (d) up to about 2% by weight sodium chloride; and
   (e) the balance water.

5. A wound dressing product as claimed in claim 1, further comprising a support layer (34) having a first side (36) and a second side (38) and comprising a permeable fabric having a plurality of interstices (40) therewithin, said support layer (34) secured to said hydrogel material (42) and located between said hydrogel material and said porous backing layer (26), wherein said hydrogel material (42) penetrates said interstices (40) to said first side of said support layer (34) such that said hydrogel material resides on both said first side and said second side of said support layer, said hydrogel material adhering to said second side of said backing layer such that said first side (36) of said support layer is adjacent to said second side (30) of said backing layer.

6. A wound dressing product as claimed in claim 3, further comprising at least one removable tab (48), interposed between said thin-film layer (14) and said release liner (46), and adhered to at least one edge of said perimeter portion of said second side of said thin-film layer by means of said adhesive layer providing a grippable surface for the removal of said release liner from said thin-film layer and to facilitate the handling of said wound dressing during application of said dressing to the wound.

7. A wound dressing product (10), comprising:
   a transparent thin film layer (14), having a center portion (16) and a perimeter portion (18) surrounding said center portion, and further having a first side (20) and a second side (22),
   a first adhesive layer (24) positioned on said second side (22) of said transparent thin film layer (14),
   a backing layer (26) having a first side (28) and a second side (30), said first side adhered to said center portion (16) on said second side of said transparent thin film layer by said first adhesive layer (24),
   a second adhesive layer (32) positioned on said second side of said backing layer (26),
   a support layer (34) having a first side (36) and a second side (38) and comprising a permeable fabric having a plurality of interstices (40) therewithin, said first side adhered to said second side of said backing layer (26) by means of said second adhesive layer (32), and
   a hydrogel material (42) secured to said second side of said support layer (34), wherein said hydrogel material penetrates said interstices (40) to said first side of said support layer such that said hydrogel material resides on both said first side and said second side of said support layer (34), and whereby said backing layer (26), said support layer (34) and said hydrogel material (42) collectively form a reinforced hydrogel patch (44);
   a release liner (46) overlying said hydrogel patch and secured to said perimeter portion

(18) of said second side of said transparent layer by said first adhesive layer (24); and

at least one removable tab (48), interposed between said transparent thin film layer (14) and said release liner (46), and adhered to at least one edge of said perimeter portion of said second side of said transparent thin film layer by said first adhesive layer providing a grippable surface for the removal of said release liner (46) from said transparent thin film layer (14) and to facilitate the handling of said wound dressing during application of said dressing to the wound.

8. A wound dressing product as claimed in claim 7, wherein said backing layer (26) is transparent.

9. A wound dressing product as claimed in claim 8, wherein a grid pattern (54) is printed on said backing layer (54).

10. A wound dressing product as claimed in claim 7, wherein said tab (48) comprises a V-shaped member (56).

11. A wound dressing product as claimed in claim 10, wherein said V-shaped member (56) comprises a first flap (58) and a second flap (60), said first flap secured to said second side of said transparent thin film layer (14) by said first adhesive layer (24), said second flap (60) positioned between said first flap and said release liner (46), and the open end of said V-shaped member (56) positioned along said edge of said transparent thin film layer and the opposing edge of said release liner.

FIG-1

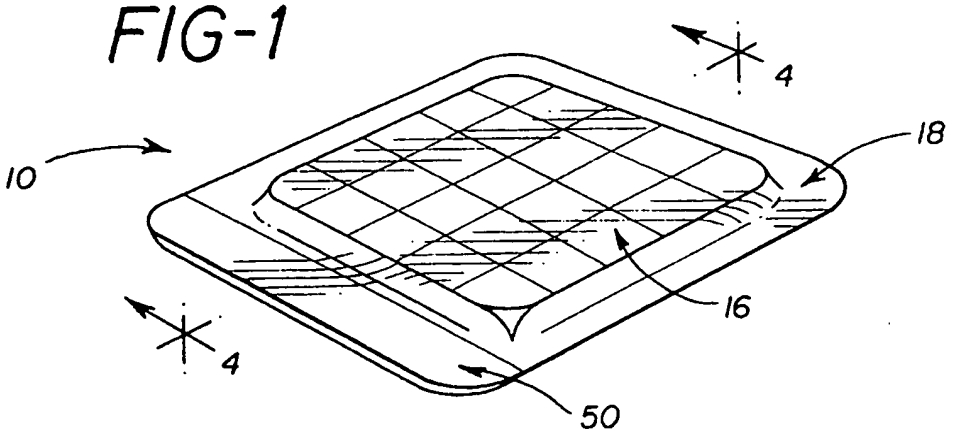


FIG-2A

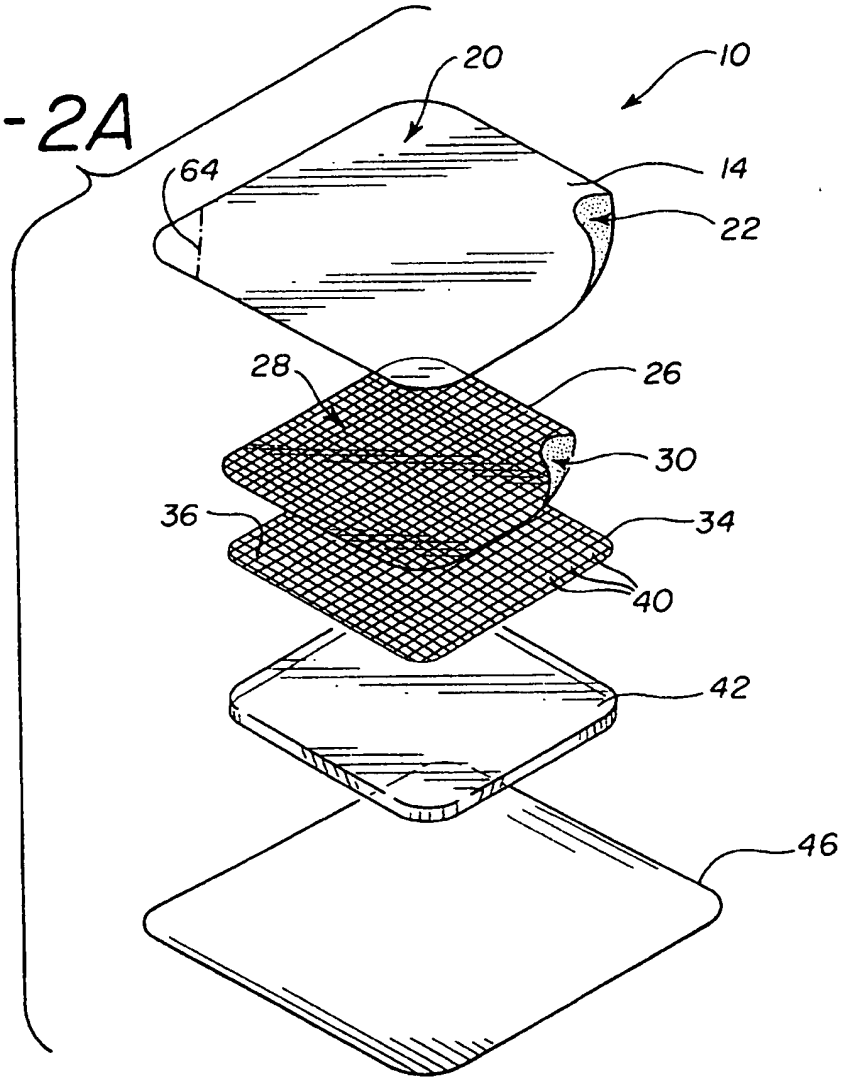


FIG-2B

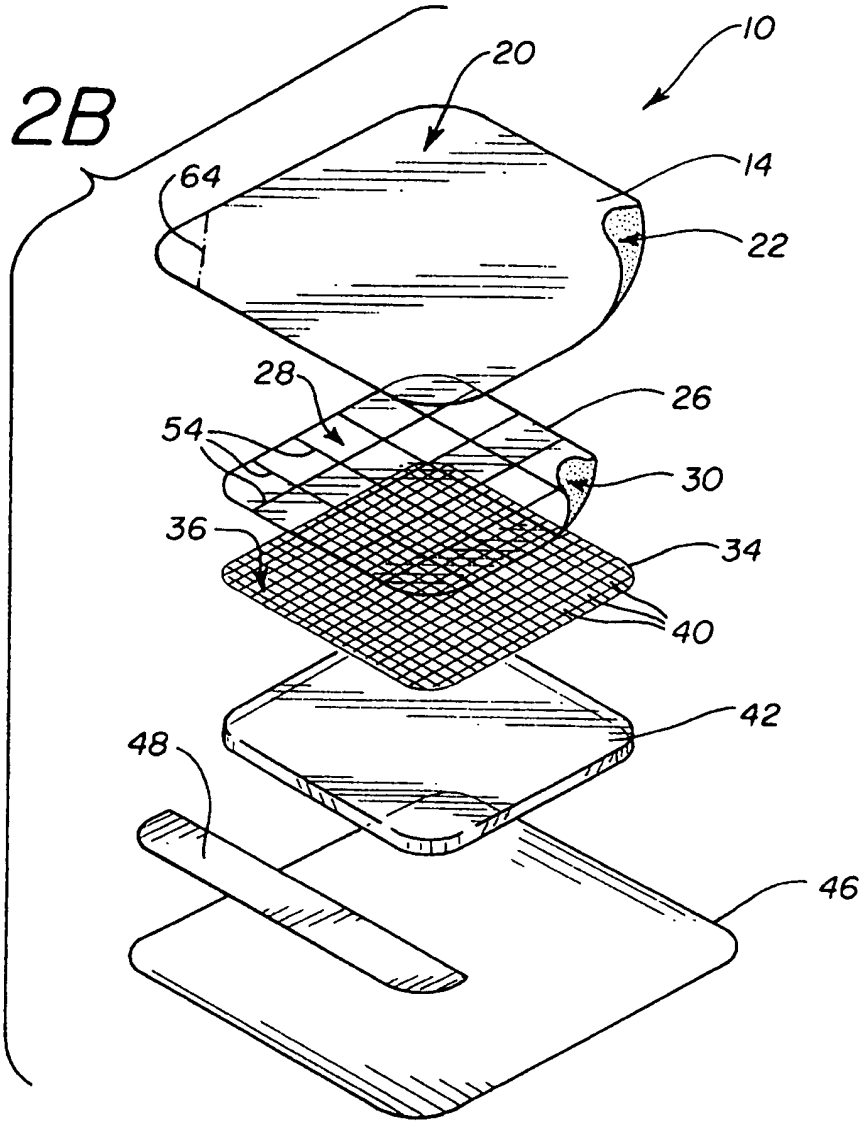


FIG-3

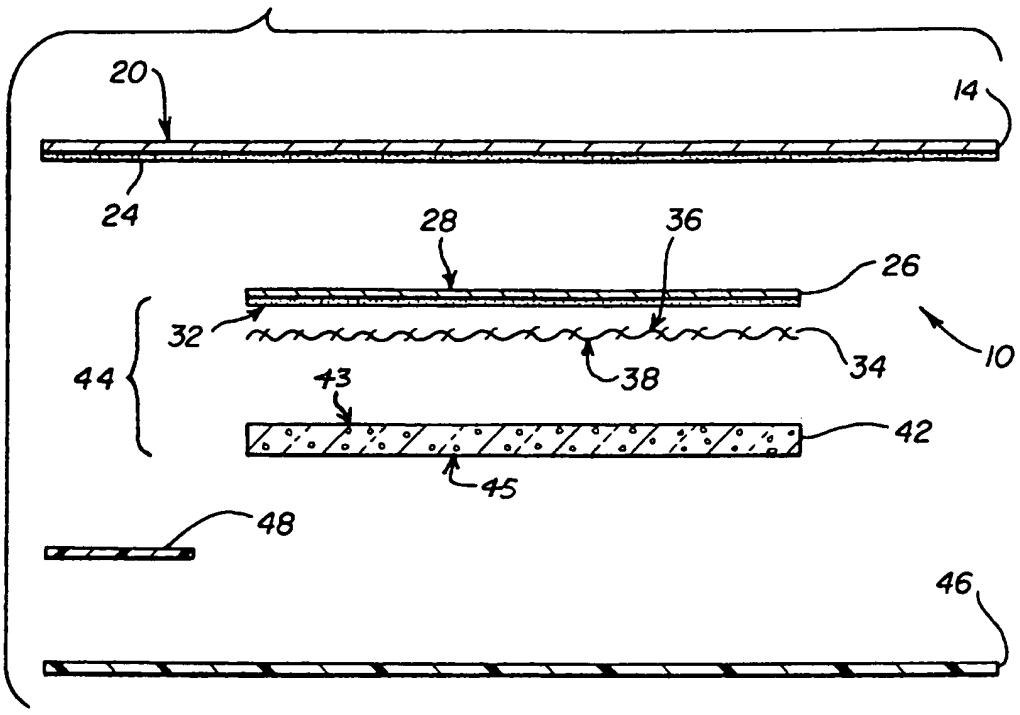
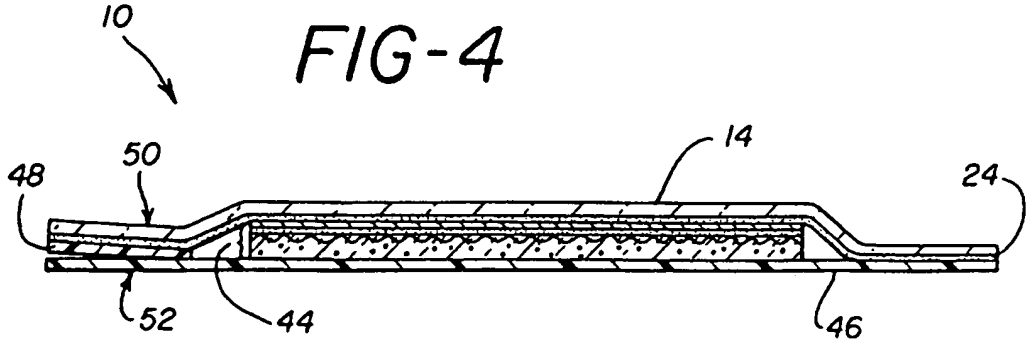


FIG-4



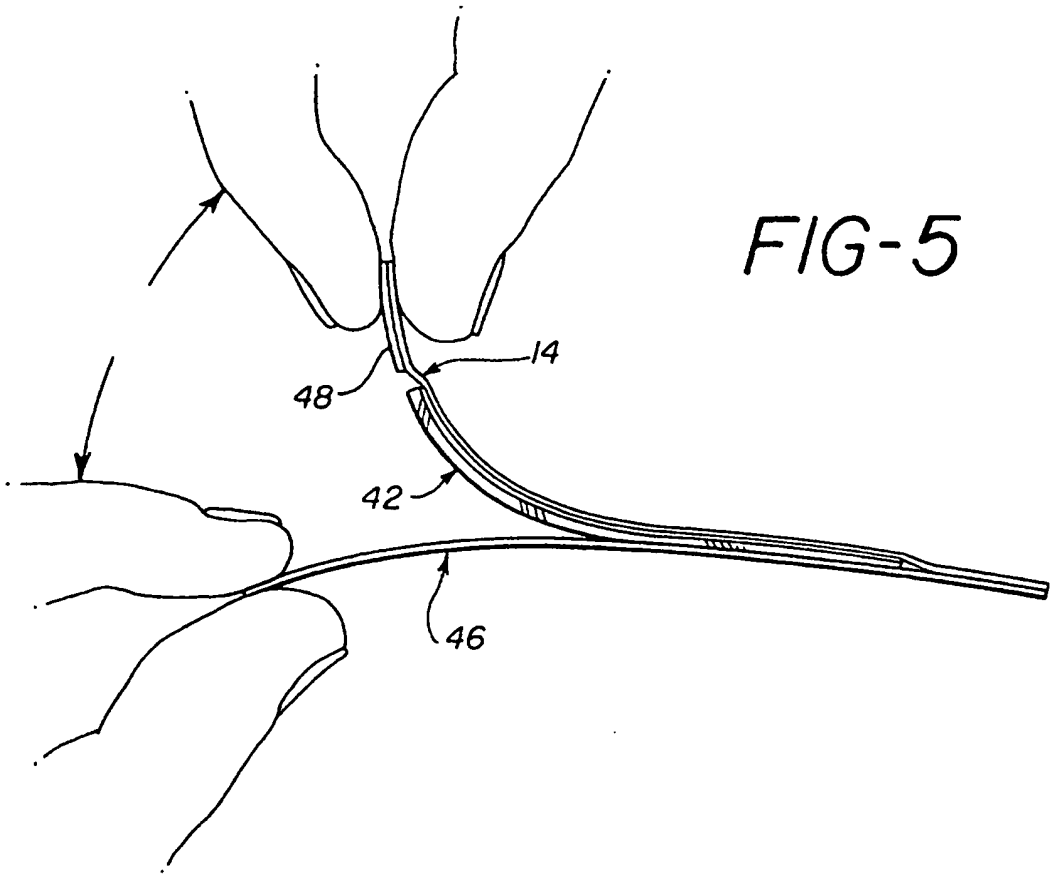


FIG-5

FIG-6

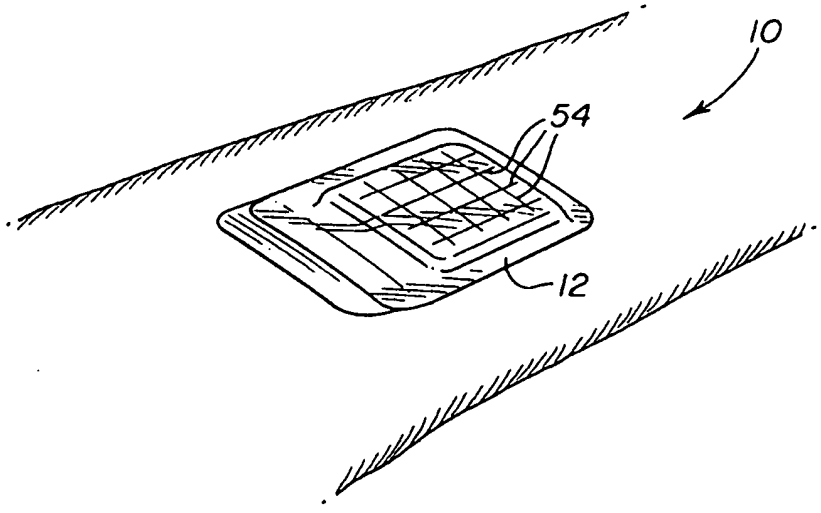


FIG-7

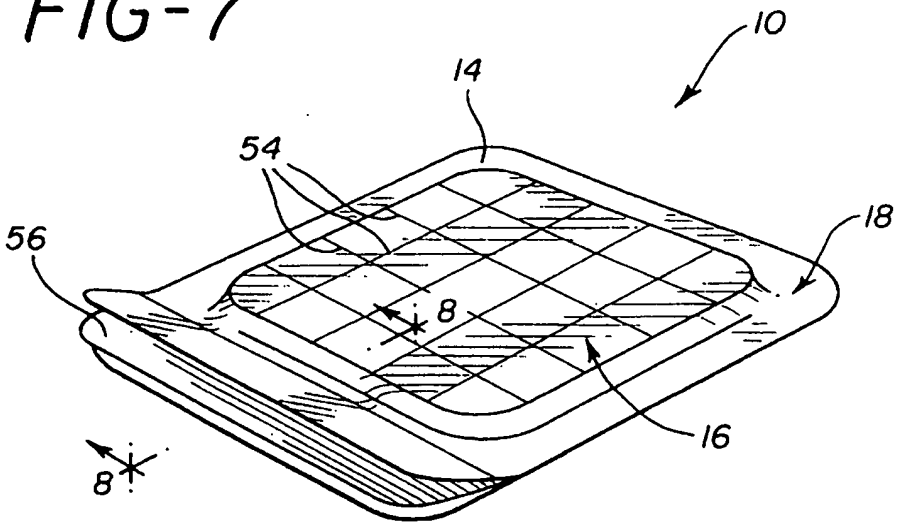


FIG-8

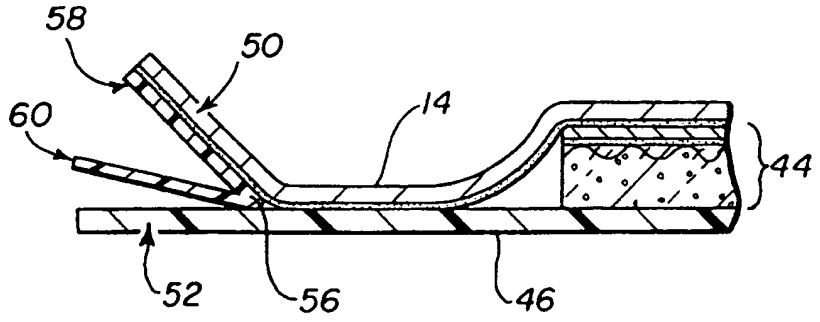


FIG-9A

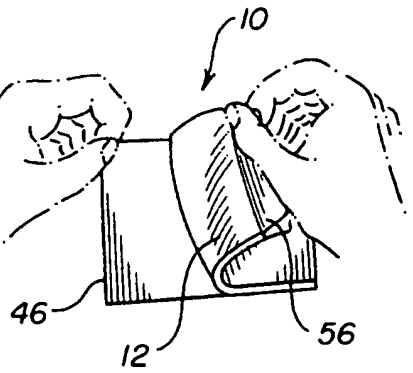


FIG-9B

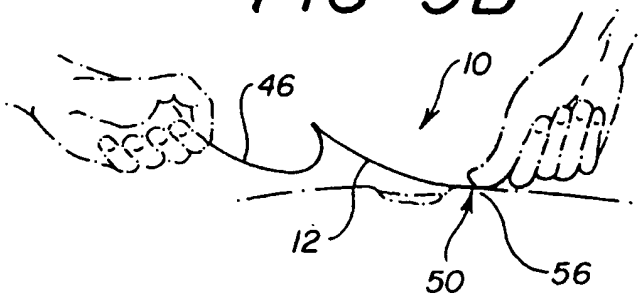


FIG-9C

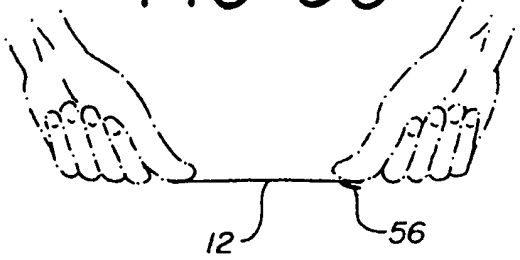
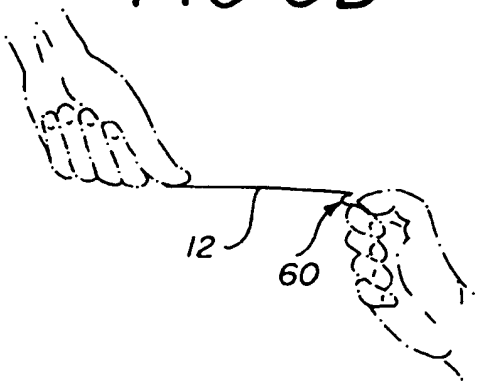


FIG-9D



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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 3512

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
D,A	US-A-5 106 629 (CARTMELL ET AL.) * abstract; claims 8-17; figures *	1,3,4,7, 9	A61F13/02
A	US-A-4 909 244 (QUARFOOT ET AL.) * column 3, line 66 - column 7, line 47; claim 3; figures 3,4 *	1,5,7	
A	WO-A-90 03155 (BAXTER INTERNATIONAL INC.) * claims 10-15; figures 4,5 *	1,3,4,7	
A	EP-A-0 455 324 (NDM ACQUISITION CORP.) * abstract; claims 9-16; figures 1-3 *	1,3-5,7	
A	US-A-5 160 328 (CARTMELL ET AL.) * abstract; claims; figures *	1,7	
A	EP-A-0 106 440 (SMITH AND NEPHEW ASSOCIATED COMPANIES) * abstract *	1,2	
A	EP-A-0 413 251 (E.R. SQIBB & SONS, INC.) * column 5, line 42 - line 50; figures *	6	TECHNICAL FIELDS SEARCHED (Int.Cl.5) A61F
A	EP-A-0 360 458 (SMITH & NEPHEW) * abstract; claim 1; figures *	6,10,11	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	8 September 1994	Kanal, P

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